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Instructions for use

SOME SPECIES OF COCCIDAE FROM
THE RIOUW ISLANDS.—PART I.

(Homoptera)

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No species of Coccidae has been recorded from the Riouw Islands which are scattered south of Singapore. In January 1946, I had an opportunity to collect these insects on Rempang, one of the Islands, and some of the species are here dealt with.

Almost all of the host plants were unfortunately not determined. The type specimens are preserved in my collection.

I am much indebted to Messrs. Y. TAKEDA and K. TAKEDA of the Japanese Shellac-Industry Company for their kind aid, through which I have been enabled to continue my work in Japan, and also to the zoological staffs of the Research Institute for Natural Resources for their kind help in carrying out this study.

***Malaicoccus* n. g.**

(Adult female) Body much swollen on the abdomen, subglobular, constricted at the hind part of prothorax, with short setae. Waxy secretions, tubular ducts and circular pores wanting; minute triangular pores very few. Head small, sclerotized narrowly around the bases of antennae and widely on the front. Antennae large, long, arising from the dorsal side, 6-segmented, covered with setae; the 1st segment stout, much wider than the remaining segments, the 6th very long. Prothorax small, fused with the head. Legs large, with many setae; trochanters defined, tarsi with long fine setae and capitate digitules; claws with no denticle, with large flattened digitules. Mentum short, 2-segmented. Dorsal ostioles developed, sclerotized and lacking pores on the lip; anterior lips very narrow, posterior lips semicircular, protruding. Spiracles without pores in the orifice. Anal ring at the hind end of body, surrounded by a pair of sclerotized parts at the anterior half, with small pores in a single row and 6 setae, not sclerotized. Anal lobes very small or wanting. Cerarii present only on the posterior part, without pores and spines, but with extremely long setae. Genital opening not surrounded by pores and setae.

Genotype: *Malaicoccus riouwensis* n. sp.

This genus apparently belongs to Pseudococcinae, and differs from

other genera in the prothorax constricted at the posterior part, the anal ring surrounded by a pair of sclerotized parts, not sclerotized, and with some small pores in a single row, and in the cerarii with extremely long setae. Near *Allomyrmecoccus* TAKAHASHI from Siam.

***Malaicoccus riouwensis* n. sp.**

(Adult female) Shining blackish brown, with no wax, in life, but dark reddish brown and a little shining when dry. In specimens treated with potash antennae, legs and mouth parts yellowish, body setae yellowish. Body much swollen on the abdomen, subglobular, narrowed anteriorly, rounded at the hind end; prothorax somewhat narrowed towards the hind end. Head small, broadly rounded at the front, fused with the thorax, sclerotized widely on the front and narrowly around the bases of antennae, covered with short fine setae except on the median narrow part of

front, which part is with some faint areolations; much fewer, but longer, stiff setae present on the venter, which are variable in size, as long as, or a little longer than, the stiff setae on the antennae, about 14--24 in number, and much shorter than the width of basal antennal segment. Antennae large, nearly as long as the body, 6-segmented, arising from the dorsum of head, covered with short fine setae intermixed with much fewer, but much stouter, setae, with many very long fine setae along the outside on the distal 4 segments; the short fine setae a little curved; the stout setae nearly as long as, or a little longer than, the fine ones, shorter than the diameter of segment; the distal long fine setae a little longer than, or

as long as, the diameter of segment; distance between the antennae much shorter than the basal segment, but longer than its width; the 1st segment large, stout, much broader than other segments, a little narrowed basally, broadly rounded on the mesal side, about twice as long as wide, with large areolations in a cluster on the basal part of mesal side; the 2nd small, about 1.5 times or twice as long as wide, somewhat narrowed towards the base, as wide as half the 1st; the 3rd slightly narrowed towards the base, somewhat longer than the 1st; the 4th as long as the 3rd, narrowed towards the base, a little shorter than the fore

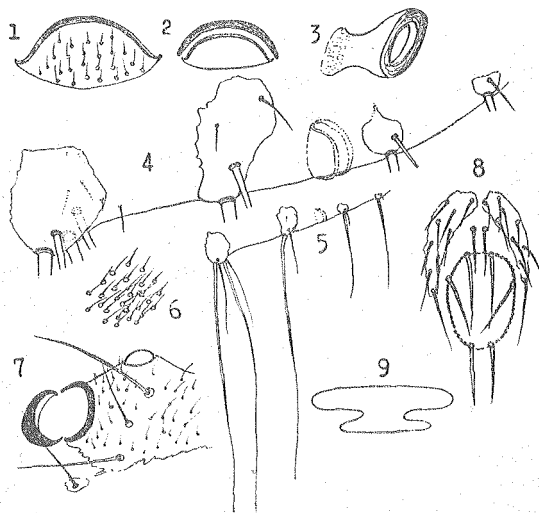


Fig. 1. *Malaicoccus riouwensis* n. sp.

(Adult female)

- (1) Posterior lip of anterior ostiole. (2) posterior ostiole. (3) Posterior spiracle. (4) Anal lobe and cerarii. (5) Setae of cerarii. (6) Setae in lateral cluster on mesothorax. (7) Eye and anterior ostiole. (8) Anal ring. (9) Ventral cicatrix.

tibia; the 5th similar to the 4th; the 6th the longest, nearly as long as the 4th and 5th taken together, a little curved, somewhat narrowed broadly on the middle part, narrowed basally, broadest near the basal part, bluntly pointed apically, much longer than the tibia. Antennal tubercles very short, developed on the mesal side, but wanting on the lateral side. Eyes each on a low protuberance, which is widely sclerotized, with many short fine setae and 2 very long setae. Prothorax short, sclerotised widely just behind the ostiole on the lateral part, a little constricted at the hind end; mesothorax with a large dense group of short setae on the lateral part laterad of the anterior spiracle; the setae directed anteriorly, fine, as long as those scattered on other parts of body. Mentum tapering, 2-segmented, the basal segment wider than long, with a pair of very long setae near the base and also at the middle, and about 10 pairs of shorter setae; the distal segment longer than wide, a little longer than the basal, pointed, with a pair of very long setae, 3 pairs of shorter ones, and 4 pairs of small ones in rows near the apex; rostral loop reaching beyond the middle coxae. Legs large; coxae as long as wide, with large areolations and many setae which are variable in length, but much shorter than the diameter of coxa; trochanters with 2 pores and many setae, a seta near the apex much longer; femora not swollen, as stout as, but a little longer than, the 3rd antennal segment, with large areolations in clusters, and many setae

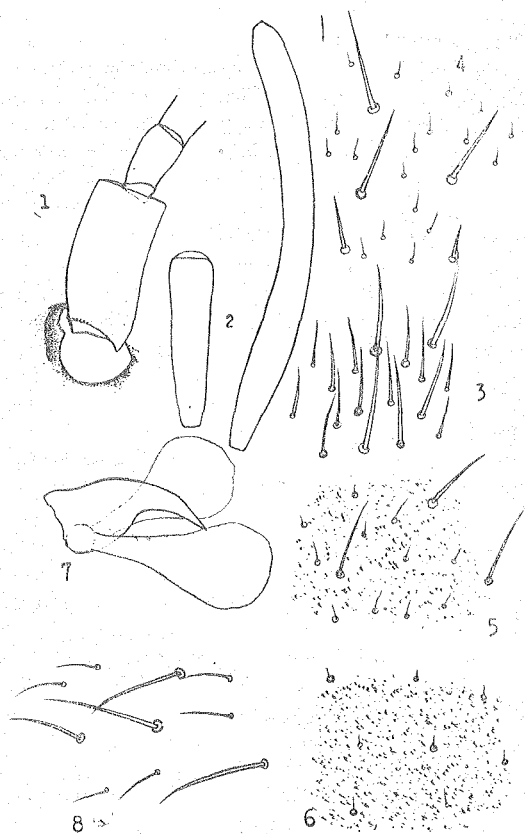


Fig. 2. *Malaicoccus riouwensis* n. sp.

(Adult female)

(1) Antennal tubercle and basal part of antenna (hairs removed). (2) 5th and 6th antennal segments (hairs removed). (3) Hairs on antenna. (4) Setae on venter of head. (5) Setae on venter of abdomen. (6) Setae on dorsum of abdomen. (7) Claw. (8) Setae on femur.

which are variable in length, stiff and much shorter than the width of femur; tibiae as long as, or slightly shorter than, the femur, nearly thrice as long as the tarsus, with many stiff setae which are shorter than the width of tarsus, and 2 much longer setae near the apex; tarsi over thrice as long as wide, with many long setae, some of which on the distal part are

very long and fine; tarsal digitules fine, flattened and distinctly dilated apically; claws much broadened on the basal half, a little concave near the base on the outside, with no denticle; ungual digitules large, flattened, wide, broadened towards the apex, larger than the claw; hind legs nearly at midlength of body, with the femora concealed under the abdomen. Posterior spiracles stout, much larger than the anterior ones, nearly as long as the diameter at the apex, constricted near the base, a little expanded and with areolations at the base, without pores within; anterior spiracles surrounded by a sclerotized part except on the posterior and basal parts, narrower than the posterior pair. Dorsal ostioles developed, marginal, sclerotized and wanting pores on the lip; anterior lips very narrow, without setae; posterior lips semilunar, projecting, rounded, with a distinct rim along the distal margin; anterior ostioles just behind the eyes, a little larger than the posterior ones, with many short fine setae on the posterior lip except along the distal margin, the setae equal in length; posterior ostioles without setae on the lip. Anal lobes small, sclerotized over the whole surface, with an extremely long apical seta, a much shorter seta and 2—5 small ones on the dorsum, and an extremely long seta and a much shorter one on the venter, the long ones as long as the 6th antennal segment. Posterior 4 pairs of cerarii present, the last pair not defined, the remaining pairs distinct, sclerotized, lacking pores, with a very long seta and a much shorter one; the penultimate pair large, nearly as large as the anal lobe, much longer than wide, much larger than the ostiole, with 2—5 small setae besides 2 long ones; the preceding pair subcircular, much smaller than the ostiole, with a long seta and a shorter one, the long one much shorter than that of anal lobe; the foremost pair small. Anal ring at the hind end of body, surrounded by a pair of narrow sclerotized parts at the above half, with small pores in a row and 6 moderate setae, the setae much thinner than the basal parts of apical setae of anal lobes; the sclerotized parts narrowed distally, with 8 or 9 setae which are mostly as long as, but thinner than, the setae of anal ring; a pair of setae present above the anal ring. Ventral cicatrix rather large, much wider than long, much constricted at the middle, the anterior part wider than the posterior part. Body with many short fine setae over the surface, numerous minute dots except on the sclerotized parts, and about 8 long setae in a row near the hind end of dorsum. Venter with some long stiff setae intermixed with the short fine ones, 2 pairs of long setae near the hind end between the anal lobes, 2 pairs of longer ones in front of the genital opening; no group of pores and setae around the genital opening. Minute triangular pores extremely scarce, scattered, a little larger than the bases of short setae; circular pores and tubular ducts wanting. Abdominal segments not discernible. Body 2.7 mm. long, 2.0 mm. wide, antenna 2.6 mm. long, anterior leg 1.15 mm. long.

Some specimens; always in association with *Polyrhachis* sp.

Anomalococcus multipori MORRISON

Host plants: Various trees including a mangrove tree.

Very common, occurring abundantly. Always protected with shelters by *Crematogaster*. A colony, however, was found outside of the shelter and attended by *Camponotus* sp., the adult females of which colony were reddish brown, as the waxy cover of the body was removed by the ant. The

Camponotus seemed to have driven away *Crematogaster* and occupied the colony.

***Lecaniodiaspis greeni* n. sp.**

(Adult female) Somewhat reddish brown, subcircular, moderately convex, with a prominent median carina, with no white wax. Antennae developed, shorter than the distance between themselves, 8-segmented; the 2nd segment a little tapering, longer than wide; the 3rd 1.3 or 1.5 times as long as wide, equal to, or somewhat longer than, the 2nd; the 4th about 1.5 times or twice as long as wide, subequal in length to the 3rd; the 5th about 1.5 times as long as wide, shorter than the 4th; the 6th a little longer than wide, shorter than the 5th, with a seta; the 7th a little longer than wide, as long as, or a little shorter than, the 6th, a little longer than the 8th, with a long seta; the 8th somewhat longer than wide, with some long setae and a very stout apical one. Legs wanting. Stigmatic clefts distinct, not sclerotized; anterior stigmatic spines 2, far apart from the cleft, gradually clavate, rounded or bluntly pointed, and one of which is very long, slender, a little curved and nearly reaching the cleft; the other much shorter, slightly curved, and shorter than the dermal tubular duct; a long similar spine present in the posterior cleft. Spiracles short, much expanded at the apex, surrounded by a sclerotized part. Some pores scattered in a distinct fold between the spiracle and cleft. Marginal setae short, simple, fine, shorter than the smaller stigmatic spine and dorsal tubular ducts, 1—3 in number between the stigmatic clefts on each side; sometimes 2 or 3 similar setae present on the dorsum between the spiracle and cleft. Rostrum as long as wide, broadly rounded apically, not tapering. Anal cleft very short, with many minute conical spines on the mesal side; a pair of very long setae present just behind the ventral anal plate; a pair of short marginal setae near the apex. Dorsal anal plate similar to that of *L. malaboda* GREEN in shape, broadly rounded at the apices of distinct lobes, ventral anal plate like *L. crematogastri* TAKAHASHI, strongly sclerotized and markings can not be examined. Anal ring with 8 long setae which are not dilated at the middle. Cribriform plates large, 6 in all, in 2 rows, densely with pits almost over the whole surface. Large circular pores many on the posterior part of venter, some on the posterior abdominal segments, few on the anterior segments. Numerous tubular ducts and minute paired pores of equal size scattered over the dorsum. Eody 1.7—2.0 mm. long.

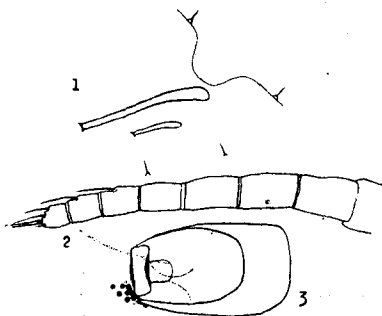


Fig. 3. *Lecaniodiaspis greeni* n. sp.

(Adult female)

(1) Anterior stigmatic cleft.

(2) Antenna. (3) Spiracle.

Some specimens; protected by *Crematogaster*.

Closely related to *L. malaboda* GREEN, but can be distinguished by the cribriform plates with pits not in clusters, the clavate stigmatic spines, the test subcircular and much less convex, with no secretion, and by

other characters. Different from *L. morrisoni* n. sp. as follows: Test subcircular, much less convex, with no wax. Stigmatic spines longer, clavate. Marginal setae fewer, very short. Spiracles smaller. Anal ring with 8 narrower setae. Dorsal anal plate sinuate at the hind margin. Cribriform plates fewer.

Named after Mr. E. E. GREEN who has much contributed to the study of the Oriental Coccidae.

***Lecaniodiaspis morrisoni* n. sp.**

(Adult female) Brown, oval, strongly convex dorsally and high, with a prominent median carina and some smaller transverse carinae running from the margin, almost similar in shape to *L. malaboda* GREEN, with wax on the carinae. Antennae developed, shorter than the



Fig. 4. *Lecaniodiaspis morrisoni* n. sp.

(Adult female)

(1) Spiracle. (2) Stigmatic cleft, spines and marginal and submarginal setae. (3) Stigmatic spine.

the anterior pair, which are usually not tapering, rounded or somewhat pointed bluntly at the apex, slightly curved, and one of them is much longer, as long as the 6th, 7th and 8th antennal segments taken together and the marginal setae, and longer than the dorsal tubular ducts; the posterior clefts with a single spine. Spiracles short, much expanded apically, surrounded by a sclerotized part. Marginal setae long, simple, a little curved, thin on the distal part, much shorter than the distances between themselves, about 6 between the stigmatic clefts on each side; some shorter submarginal setae also present mostly in a row on the dorsum; a few similar setae near the stigmatic spines. Rostrum wider than long, rounded at the apex, 1-segmented. Anal lobes short, with many minute conical spines on the mesal side. Anal ring with 10 or sometimes 12 setae which are flattened, stout, dilated on the

distance between themselves, 8-segmented; the 2nd segment *se* long as, or a little longer, than wide; the 3rd and 4th a little longer than wide, subequal in length to the 2nd; the 5th subequal in length to the 4th, a little shorter or longer than wide; the 6th as long as, or shorter than, wide, shorter than the 5th, with a long seta; the 7th similar in shape and size to, or smaller than, the 6th, with a long seta; the 8th wider than long, or as long as wide, subequal in length to the 7th, with 3 long setae and a stout apical one. Legs wanting. Stigmatic clefts distinct, somewhat sclerotized in some specimens, with numerous pores, with 2 spines in

part beyond the middle and pointed apically. Dorsal anal plate narrow, without lobes. Ventral anal plate similar in shape to *L. cremastogastri* TAKAH., strongly sclerotized and no markings can be observed. Venter with numerous large circular pores on the posterior part and on each posterior abdominal segment near the hind margin. Cribriform plates variable in size, with pits densely over the surface and not in clusters, in 2 pairs of groups, 9-13 in number on each side. Numerous long tubular ducts and minute paired pores of equal size scattered over the dorsum. Body about 2.2-2.5 mm. long.

Many specimens; common, always protected by *Crematogaster*. Closely related to *L. malaboda* GREEN and *L. cremastogastri* TAKAHASHI, but differs from the former in the presence of more cribriform plates, which are with pits over the surface, and in other characters, and distinguished from the latter by the anal-ring setae not filiform apically, the more cribriform plates, and by other points.

Named after Dr. H. MORRISON who has much contributed to the study of Coccidae of the Malay Peninsula.

***Coccus punctuliferus* GREEN**

Some specimens, protected with shelters by *Crematogaster*.

***Coccus caviramicolus* MORRISON**

Host plant: *Macaranga griffithiana*.

Very common in the hollow of the stem and branch of the host tree.

***Lecanium psidii* GREEN**

A single specimen.

***Lecanium formicarii* GREEN**

Some females, protected with shelters by *Crematogaster*.

***Paralecanium ovatum* MORRISON**

A single specimen.

***Paralecanium vacuum* MORRISON**

3 females.

***Paralecanium maculatum* n. sp.**

(Adult female) Grayish white, with a large brownish black patch at the center, and 8 much smaller subcircular brownish black patches in a row on the submarginal area. Elliptic, about 1.6 times as long as wide, nearly symmetrical. Marginal zone well defined by a narrow sclerotized band on the venter, which band is extending to the anal plates along the anal cleft. Dorsum sclerotized at the central dark part, with some minute pores scattered, wanting ridges, areolations, reticulations and depressions. Eyes distinct, separated from the marginal zone. Antennae slender, tapering, nearly as long as, or a little shorter than, the distance between themselves, much longer than the width of marginal zone, 6-segmented; the 2nd

segment about twice as long as wide; the 3rd the longest, slightly over twice as long as the 2nd, shorter than the distal 3 segments taken together; the 4th and 5th equal in length, about twice as long as wide, shorter than the 2nd; the 6th a little longer than the 4th and 5th taken together. Legs developed; fore femora a little swollen; fore trochanters and femora together nearly as long as the tibia and tarsus together; tibiae much shorter than the tarsus; fore tibiae somewhat swollen, fore tibiae and tarsi together a little longer than

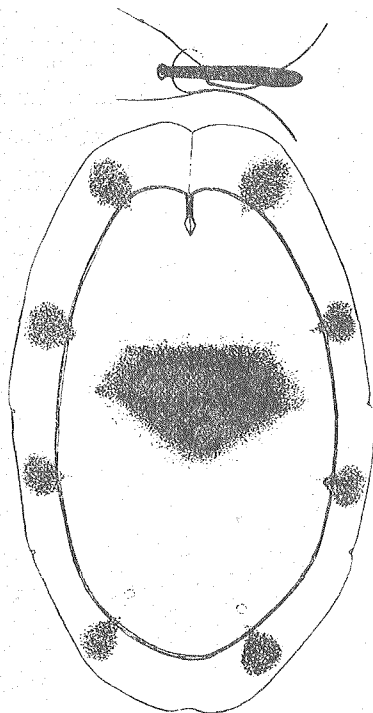


Fig. 5. *Paralecanium maculatum* n. sp.
(Adult female)

Body and stigmatic cleft.

groups of pores laterad of the bristles, each group with about 14 pores; some pores also scattered behind bristles. Body about 2.2 mm. long.

A single specimen.

This species is characterized by the presence of dorsal markings and by the single stigmatic spine.

(To be continued.)

the distal 2 antennal segments together; tarsi not well separated from the tibia, with long capitate setae; ungual digitules stout, expanded distally. Stigmatic clefts closed, within the margin, not sclerotized along the edge, with no tubercle, but with a single long spine which is slender, straight, somewhat narrowed basally, rounded at the apex and nearly reaching the margin. Stigmatic furrows very short, indistinct, as long as about half the width of marginal zone. Spiracles slender; some minute pores arranged almost in a row between the spiracle and cleft. Margin not sclerotized, without tubercles or teeth; flabellae wider than long, nearly elliptic, slightly or a little overlapping, about 17—20 in number between the stigmatic clefts on each side. Anal cleft closed, not thickened along the margin on the marginal zone, about 1:3 times as long as the width of marginal zone, about thrice as long as the anal plates. Anal plates over twice as long as wide, rounded at the lateral angle, pointed at the tip, somewhat longer than the distance between the plates and marginal zone, with a few setae, the latero-posterior margin slightly rounded broadly, a little longer than the latero-anterior margin which is straight. Anal ring with 8 setae reaching the plates. Venter not sclerotized around the anal plates, with a pair of blunt bristles in front of the plates, and a pair of oblique